



THE EVOLUTION
OF LACTANET
ATLANTIC DAIRY
PRODUCTION

ATLANTIC
STATS & TIPS

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THE EVOLUTION OF LACTANET ATLANTIC DAIRY PRODUCTION 2019

STATS & TIPS

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WORD FROM OUR CEO

Although we are still living the COVID-19 crisis, it is nice to know that life goes on. Dairy production is a passion for producers that evolves year after year and we are glad to be a part of their success. Thus, we are pleased to present the Evolution of Lactanet Dairy Atlantic Production and the first edition under the Lactanet partnership.

Farm profiles and articles from our experts have always been an important part of this publication and this year is no exception. We have paid tribute to several herds where producers have shared their journey, vision, perspective and wisdom, for what has brought them some success.

In Canada, the dairy landscape can be unique in each province and the statistics are often more meaningful to producers in their respective location. Our annual publications are published by region and available on our website. Although we highlight many top performing herds, the featured information would not be possible without the commitment of all producers who participate in dairy herd improvement.

As farms continue to be fewer, larger and more technically advanced, producers recognize the advantages of technology to help them become more efficient. As we continue to transform data into powerful and insightful metrics, producers can take the guess-work out of day-to-day decisions, raise the bar, set progressive goals, reach for sustainability and establish profitable business models.

As you read through this publication, you will notice many new tools that have either been recently launched, are coming our way soon, or are in development. As we establish new and innovative offerings, that are actionable and understandable, we invite you to have conversations with our excellent technicians or advisors to see if any are right for you. The Lactanet partnership allows us to service you in new and progressive ways. Collectively, we can leverage our strengths and offer you better solutions to herd management and farming life.

Sincerely,

Neil Petreny
CEO, Lactanet Canada



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WORD FROM OUR CHAIR

As Chair of Lactanet, I'm honoured to connect with each dairy producer in the country through the 2019 Annual Publication. As a dairy farmer myself, it is important for me to listen to and engage with fellow producers, experts and advisors, to not only improve my business, but strengthen the industry at large.

On my family farm in the Beauce region of Quebec, we manage 125 cattle, including 75 dairy cows, and harvest 300 acres of alfalfa, corn and hay. Like many of you, we are diligent in developing an efficient and profitable herd and with our son now involved in our operation, we are also considering expansion and technology.

In 2019, as the Lactanet partnership was launched, it was a year of industry cooperation, communication, consolidation, and coordination. Collaboration is the key to change and alliances have always been part of our resilient dairy industry. Positioning our industry for the future isn't easy. It requires commitment, planning and patience. It is important, now more than ever, to extend what we can offer, in an affordable way, to keep pace with an evolving marketplace.

We understand the challenges brought on by too much information and strive to provide you with exactly what you need, when you need it. Our range of products, services, tools, training and workshops can help you explore what lies beneath the data for a better understanding of your herd.

Each producer has a range of different pursuits and unique needs. We want you to have a distinctive and valuable experience with us and trust that the information we can provide you will help you adapt to the competitive landscape ahead. It's our goal to provide meaningful data, metrics and benchmarks to nurture and protect your assets.

On behalf of the Lactanet Board, we will continue to act in the best interest of dairy producers across Canada and strive to prepare our industry for the future. With our combined resources, expertise and a unified strategy, there is much more that we can accomplish together.

Sincerely,

Barbara Paquet
Chair, Lactanet Canada
Dairy Producer, Saint-Côme-Linière, Quebec



WORD FROM OUR REGIONAL MANAGER

WE WILL BE READY TO ADAPT

We are pleased to introduce Part 2 of our Evolution of Lactanet Atlantic Dairy Production Annual Report. It has become almost cliché to say, but we are living in unprecedented times as we navigate our way through the COVID-19 pandemic. We will come through this, but the new normal could look very different. Nonetheless, our industry has become even more important as we are called upon to feed the population, while dealing with border closures, market interruptions, supply challenges, and changing consumer expectations. We will need to be ready to adapt to these changing times if we are to be successful.

At Lactanet, we recognize that this changing world is creating more challenges to produce milk profitably. As we speak with many of our top managers here in Atlantic and ask what they are focused on, profitability and “optimizing production with what you have” are the first words out of their mouths. We have also heard from many of you lately that when you look at some of the data we report, you want to see the management numbers/benchmarks of the TOP performing herds so you know what farms you should go visit when you are looking for areas to improve in your own operation. Therefore we have put more emphasis on management areas, tools, data, and benchmarks that are closely related to not only improved animal performance, but maximizing profit. You will see tables with more benchmarking, ranking herd performance by parameters

like production and milking system. We have also added some tables to show the top herds in each province for Herd Performance Index, which is an index that is calculated focusing on six areas of management closely related to farm profitability, including milk value. There are also several articles from our Lactanet experts that focus on management areas/tools and how to use them to maximize profit.

I would encourage you to read the producer interviews. I want to thank Robbie MacGregor, Matt Clarke, Ian Richardson, and Amber & Brian Craswell, who all took the time to sit with me (virtually, of course) to discuss their operations. I always enjoy listening to our top managers talk about what they do with the passion that they have when they do it. I believe that these interviews provide some valuable insight, with common philosophies, yet some different perspectives, at the same time.

I want to thank everyone who contributed to this Annual Report and to those of you that continue to offer feedback and ideas on how we can present the data and our information most effectively, to meet your needs. I look forward to working with our Lactanet Team, our industry partners and our valued farmers as we move this great industry forward.

Stay safe everyone.

Jeff Gunn
Atlantic Regional Manager

MacGregor Dairy Farm Ltd.

Robbie & Mary MacGregor

Churchville, Nova Scotia

Production Kgs: 14,167

Kgs Fat: 557

Kgs Protein: 457

Herd Performance Index: 921

Milk Value: \$10,777



Tell us a bit about your farm and herd. History, evolution of operation, etc.

"I (Robbie) joined my father and mother (John and Arlene) on the family farm in 2000, after graduating from the Nova Scotia Agricultural College. Today, my wife Mary and I own the farm, and together along with our four children, Hudson (14), Tanner (13), Bridget (11) and Nora (7), manage the operation with my parents. We made a large expansion in 2003 that saw the old free-stall barn, which became maxed out at 90 heads (1 kg per cow), be replaced with a 4-row, sand-bedded barn with 220 stalls. A second expansion took place in 2011 with an addition to the barn which brought the capacity up to 360 stalls. The milking system is a double-12 parallel parlour and is used to milk the herd 3 times a day. We farm 750 acres, including 350 acres of corn silage and 400 acres of alfalfa/grass mix."

What are the primary goals of your farm?

"The primary goal for us is to maximize kilograms of fat per cow, while maintaining animal health. Look after your animals — feed them right, get them bred and in calf efficiently, get them freshening right, and the rest falls in line."

What factors or management practices do you attribute to being a top-producing/performing herd?

"There are a lot of things that contribute to milk production like genetics, but most dairy farms today have good genetics. The number one key factor for us is feed quality. We harvest four cuts of grass per year, every 28-30 days and rotate the fields often, while ensuring soil fertility. We also grow BMR corn to improve digestibility. Another key for us is to get our cows bred and in calf quickly. We pay close attention to this to ensure we are maximizing milk per cow in the barn. Another key factor is that you have to look after your cows. Cows need to be healthy and our calves have to get off to a good start with an adequate amount of quality colostrum in the first few hours of life. Animal health is important to us — we have our hoof trimmer in 10 times per year and a foot bath is a very important part of the day-to-day management. Finally, you need good employees and you need to look after them — keep them engaged. Our dairy manager, Mike Archibald, has been with us for 10 years and is a key piece to our operation. We also have a full time mechanic, Troy Miller, who keeps the machinery

running so things move along smoothly. All of our guys play an important role, Shawn, Carl, Jeremy, Sulinder, Arminster and Jagsir should be mentioned."

What are your greatest successes? Challenges?

"Expansion has meant a lot of investment and taking on debt, but we developed a plan and set it in motion to pay down the debt as quickly as possible. We do not overspend, but we recognize that we have to spend money to make money. We have focused on maximizing kgs per cow, which has allowed us to continue to buy more quota, while optimizing our herd size to focus on efficiency and profitability. We have been able to achieve the financial goals we set for ourselves (most years). Money is not the main driver for us, but in order for your business to be viable and sustainable, you need to be profitable. We look at our three main expenses: 1. Bank loans; 2. Feed costs; 3. Labour. For the bank loans, you set a plan in place and pay down the debt, and the relationship with your lender strengthens. For the feed costs, produce the best quality forages you can, and work with your team to monitor the numbers. For labour, treat your employees fairly, engage them, and this will come back to you in the form of loyal and dedicated people."

"Challenges? The main one is to find reliable people – you must keep them engaged. Another challenge for us is the ability to buy quota and to expand."

Why are you a Lactanet customer? What Lactanet tools/reports do you use to help manage your herd? What do you need and expect from Lactanet to help you meet the challenges you mentioned to ensure the future success of your operation?

"I was not looking at the Lactanet reports a couple of years ago like I do now. Because of that, I questioned the value of being on test. With Stirling Dorrance's advisory service and interpretation of the test-day data, I see value in having the numbers to better manage our herd. Having that extra set of eyes on the numbers is important, along with different ideas — a different perspective. You guys care — it feels like you are trying to find ways to help the farmer."

What do I expect from Lactanet in the future? I believe that Lactanet needs to take a lead on profitability. You need to do more to link performance data to the economics, with a focus on profit. That would be important for us and for the industry."

Anything else to add?

"For us, we are not scared to change, to adapt. This business can get to you. Some days things don't always go as planned and if we feel bad about something, we try to change it — we try not to dwell on it. We love what we do and we want to create something here that our kids will want to be a part of. That is the real bottom line."



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PROFITABILITY IS THE 'BOTTOM LINE'

Jean Brisson, agr., Dairy Production Expert;

Jeff Gunn, Atlantic Regional Manager, Lactanet Canada

Profitability is never a given in agriculture, including in dairy farming. 2020 is even more challenging so far. A farm's profitability depends on a number of factors and the list is certainly a lengthy one. The Lactanet Profitability Report does not pretend to predict how much money you have in the bank, as we do not have access to all farm expenses. However, some of the herd data can have a direct impact on profitability potential.

Profit per day of life

At Lactanet, we have data like date of birth, age at first calving, milk production, kg of butterfat and of protein produced. We have the component prices per province and per month so we can figure out income from milk sales. We do not have building and machinery depreciation, salaries or insurance costs. Milk income minus standard charges (same basis for each farm either per cow, per heifer or per hectolitre) gives you the profit per day of life. One cow who has completed three good lactations with good components, who has calved within decent intervals could potentially make you \$5 per day of life, maybe more. A promising 1st calf heifer who calved 2 months ago can't be on the positive yet as she has just started to generate some income after a couple of years of investments.

Profit per day of life is the way we have decided to present the Profitability Report. The average in 2019 for the Atlantic Provinces was -\$0.28/day of life. It does not mean that dairy farming is not profitable but it gives you a benchmark to compare. Is your herd +\$1.00, +\$2.00, -\$0.50/day of life? You can ask your Lactanet technician for your Herd Summary Report, and call on your Lactanet advisor to review it with you.

Age at first calving

There is no magic. A heifer who calves at 30 months of age will cost more than the one who calves at 24 months. More bedding, more silage, more time,

more room. Good management may lead to a high producing first calf heifer calving as early as 21-22 months. That is where you decide if young cows will start their career at -\$2,800 or -\$3,600.

Productivity

Again, no magic. A first lactation at 7,000 kg, 260 kg butterfat and 220 kg protein will not be enough to cover the cost of raising. In short, at the end of her first lactation, she will not have provided enough of a return to keep her in the milk line. In your herd, how many first lactation cows are showing positive when calving for the second lactation? Ask your Lactanet technician for your Cow Lifetime Profit Report.

Demography

The production in first lactation is typically not enough to cover the rearing costs. If first-lactation cows represent up to 50% of the herd, it is no surprise to see the herd profit per day of life be a small number. Greater profit often comes with 3rd or 4th lactation cows and older. A good balance between young cows and older cows increase the chances to generate a better herd profit per day of life. Older cows can sometimes bring up to \$12,000 to \$15,000 of lifetime profit, if not more. See for yourself where your herd stands in your own Lactanet Profitability Report.

Conclusion

At Lactanet, we constantly work at putting economic value on our herd data to help you be as profitable as possible. Our wish is that your herd average profit per day of life be the highest possible. Our objective is that you use the powerful data and call on our advisory team to work with you in getting the highest possible profit!

Crasdale Farms

Brian & Amber Craswell

Hunter River, Prince Edward Island

Production Kgs: 12,796

Kgs Fat: 491

Kgs Protein: 428

Herd Performance Index: 812

Milk Value: \$9,383



Tell us a bit about your farm and herd. History, evolution of operation, etc.

"Our years of work in the auction and cattle business gave us tremendous opportunities to visit farms around the globe. We took what we learned from our travels to build our dream barn in 2015. We moved from the old tie-stall barn (62 stalls) to the new barn on January 29th. Cow comfort and efficiencies were at the forefront when designing the barn. We went from one of the oldest, most antiquated barns on the Island to one of the most automated De Laval VMS free-stall facilities in North America, at the time. Our facility has two robots, and an automated feeding system for our lactating cows and dry cows. Feed is delivered 12 times a day — from three mixes — to our lactating cows, to ensure there is consistent, fresh feed in front of them at all times. We farm together with our daughter, Aleah (11) and several part-time employees."

What are the primary goals for your farm? Areas of focus?

"It wasn't that long ago we were at a 220 BCA and 9,500 kg average, to where we are today. The individual

cow is our primary focus. This breaks down to a focus on cow comfort, herd health, genetics and nutrition. We spend a lot of time thinking about how we can do better for our cattle and ourselves. Our primary goals are to breed and develop functional, efficient and profitable cows that work anywhere — cows that are low maintenance and feed efficient. We always say that the best cows in our barn are the ones we never notice."

What factors or management practices do you attribute to being a top-producing performing herd?

"Our TEAM! It is about having a great team. From the people that work with you every day, to the advisors you hire. We have been VERY fortunate to have awesome people work with us. Our crew that help out are really invested in doing the best job they can, and truly care about the farm and animals. It is the same for advisors we work with. Your veterinarian, banker, Lactanet team, nutritionist all have to share your vision. One of the smartest guys we know once told us his secret to success was to surround yourself with people who are smarter than you."

Vision and goal setting is crucial. There isn't someone that works with us that doesn't know what they are. They need to be clear, concise and well-communicated. We have monthly meetings scheduled just for this, where we breakdown our targets and set deadlines. This helps give us constant traction in our goals."

What do you feel are your greatest achievements? Challenges?

"The most satisfying accomplishments for us have been setting breeding (25% pregnancy rate) and production (40 kgs per cow) goals in 2015 when we built the barn, and then only meeting these goals, but surpassing them. Today, we are aiming for a 30+ pregnancy rate, 50 litres per cow, and 2 kgs of butterfat per cow. These goals will not be met at the expense of economic efficiency.

Challenges? Farming has many challenges and mental health certainly has to be mentioned. We all have those days where you feel like everything is going wrong! Add the external industry pressures and it can be a lot at times. Fortunately, we make a good pair as we both value discussing these challenges, and try to always look for the positives.

Another aspect we struggle with is actually related to goal setting. We are both goal-setters, but the problem is there is always a new goal! You can struggle with

always trying to achieve more or fit more in a day. Another wise man once said to us that it is important to celebrate your successes because again, we all have those days."

Why are you a Lactanet customer? What Lactanet tools/reports do you use to help manage your herd? What do you need and expect from Lactanet to help you meet the challenges mentioned in Question 4 to ensure the future success of your operation?

"Goal setting and benchmarks are important for us. Information and access to information has been key for us in setting protocols, evaluating herd performance and our performance. Having an unbiased assessment on your herd is valuable to measure if you are going in the right direction. That is what Lactanet provides for us. Farmers are going to need to become even more efficient and Lactanet can help with this through the data and the benchmarking."

Anything else to add?

"Our daughter, Aleah (11), is really loving Compass as she shares our passion for animal genetics. She spends a lot of time looking at the genetic inventory and potential matings. It is pretty special to see her scroll through the lists."



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THE IMPORTANCE OF THE FEED BUNK IN FREE-STALL HOUSING

Steve Adam, Dairy Production Expert, Comfort & Welfare, Lactanet Canada

Feed bunk design plays a crucial role in the welfare of farm animals. The repercussions of a poorly designed feed bunk include, but are not limited to: neck injuries, lameness, and substandard body condition.

Understanding the feeding behaviour of cows and the impact of inadequate bunk space can help producers make informed decisions.

BEHAVIOUR

Competition: Like all herd animals, dairy cows prefer to eat as a group. Insufficient space at the feed bunk generates competition, which may compromise the health and well-being of individual cows. Indirect competition arises when cows modify their behaviour to access the feed bunk, either by visiting during non-peak times of the day or by eating faster.

Direct competition occurs through altercations or aggressive behaviour between individual cows. Some subordinate cows will even begin to distance themselves from dominant cows when feeding.

HEALTH AND PRODUCTION

Foot Health: Limited bunk space at peak times will also increase the amount of time that subordinate cows spend standing while they wait for bunk access. Inactive standing on a hard and damp surface increases the risk of developing foot health problems and the incidence of lameness in the herd.

Fatty Acid Profile: A study conducted by Woolpert in 2017 showed that the greater the bunk space, the greater the production of *de novo* fatty acids, which are synthesized in the mammary gland. This suggests that when cows have more room at the feed bunk, their stress level decreases, their feeding behaviour is more natural, and ruminal fermentation is better. The production of *de novo* fatty acids is associated with increased milk fat levels.

Reproduction: The probability of pregnancy at 150 days increases as bunk space increases.

Milk Quality: For every 10 cm of additional space at the feed bunk, somatic cell counts dropped by an average of 13 per cent, suggesting that the cows were eating



after milking rather than returning immediately to their stalls to lie down while the teat sphincters were likely still open.

Transition Cows: A number of studies show that cows are more likely to develop subclinical ketosis and metritis when feed bunk space is limited.

RECOMMENDATIONS

Space: An experiment done by Lactanet at McGill University's Macdonald Campus Farm determined the overall width of a Holstein cow exceeds 76 cm (30 in.). Hence, lactating cows should be allowed at least 60 cm (24 in.) of linear bunk space per cow under the assumption that one in four cows does not have access to the feed bunk. For dry and fresh cows, the recommended space allowance is at least 76 cm (30 in.) per animal, and the optimal allowance for close-up cows would be 90 cm (36 in.).

Feed Bunk Design: The bottom of the feed bunk should be 10 to 15 cm (4 to 6 in.) higher than the height of the cows' feet. Producers who are not equipped with automatic feed pushers may use shallower feed bunks (1 to 3 in.) to keep the feed close to the animals.

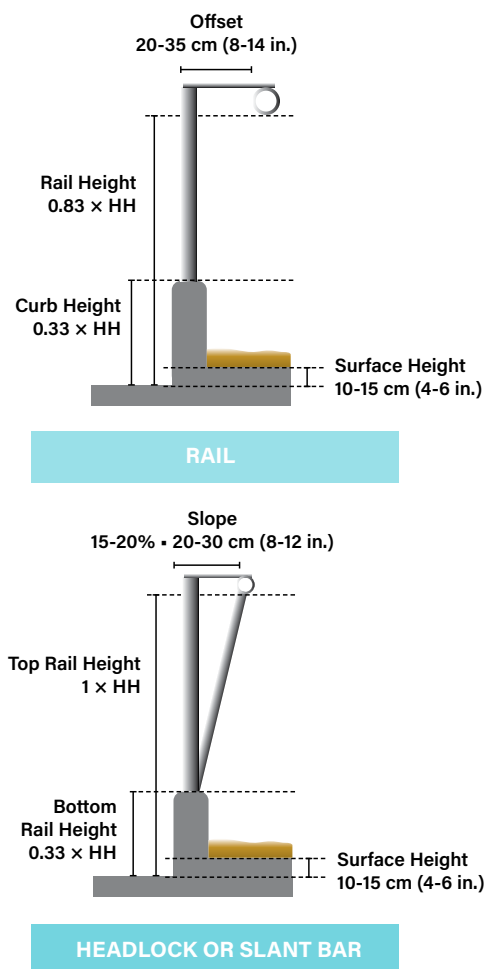
Height of the Manger Curb: The curb height should be roughly $\frac{1}{3}$ of hip height (HH). This formula is useful when it comes to determining the appropriate curb height for replacement animals or for dairy breeds other than the Holstein.

Feed Barriers: Subordinate cows seem to benefit from a physical barrier separating them from dominant cows. Cows also spent less time standing inactive in the feed alley, which may decrease the risk of lameness. For replacement animals, headlocks should be adjusted for the tallest animals in the group. Likewise, a slope of at least 15 to 20 per cent (20 cm or 8 in.) will ensure easier access to feed. The important thing is to make sure the feed bunk is long enough for the number of animals present.

To avoid neck injuries, a feed rail should be offset over the manger by 20 to 35 cm (8 to 14 in.) from the inside of the curb on the cow side. Pushing feed up frequently also reduces the pressure on the cows' necks.

CONCLUSION

Different groups of animals have different requirements. A well-designed feed bunk can make a big difference in ensuring healthy and productive cows.



Adapted from CRAAQ 2008 & Anderson 2016



Larch Grove Farms Ltd.

Ian Richardson

Cormack, Newfoundland

Production Kgs: 11,199

Kgs Fat: 466

Kgs Protein: 376

Herd Performance Index: 816

Milk Value: \$8,974



Tell us a bit about your farm and herd. History, evolution of operation, etc.

"I moved from Prince Edward Island to Newfoundland nineteen years ago (2001) because I wanted to get into the industry and the opportunity to grow was greater in Newfoundland. We started with 60 Ayrshires and today are milking approximately 200 purebred Holsteins. We are still milking in the original tie-stall barn and have added pieces onto the barn, as we needed to grow. We farm 1000 acres and meet our forage requirements, while growing a small amount of grain. We purchase the rest of our feed requirements/ingredients. We have nine

full-time employees and I farm with my fiancée, Jessica and my three children, MacKenzie (9), Landon (6), and Nash (1)."

What are the primary goals for your farm? Areas of focus?

"I have always had a big focus on using the top genomic LPI and TPI bulls, with a focus on daughter fertility and strong components. We genomically test every animal. Fifty percent of our herd is bred beef and we use sexed semen on cows and heifers that we want heifers from. We always focus on age at first calving and cull early, rather than letting things drag on."

What factors or management practices do you attribute to being a top-producing performing herd?

"Nutrition is the biggest. We focus on producing really good forages. We do this with a sound nutrient management plan, and work to maximize output, using up-to-date fertilizer and lime recommendations. We also put a plan in place to ensure that the machinery is lined up and ready to go when needed. For the ration, we work closely with our Shur-Gain team. We also focus a lot on breeding efficiency and implement a strict synchronization program. We are getting cows bred faster."

What do you feel are your greatest successes? Challenges?

"We want to take our genetics to the next level. We used to be constantly looking to buy heifers. Now, ours are as good as we can buy. We have always insisted on using top bulls and the results are paying off.

Greatest challenges? I guess it would be trying to evolve in this ever-changing world (pandemic, trade deals,

consumer concerns, etc.), while living on an island dealing with some of the worst weather we have seen in a while, in the past couple of years."

Why are you a Lactanet customer? What Lactanet tools/reports do you use to help manage your herd? What do you need and expect from Lactanet to help you meet the challenges mentioned in Question 4 to ensure the future success of your operation?

"We need the data. The Somatic Cell Reports are probably some of the most important. I also really like the Transition Cow Index. We need the data to tell us which cows and heifers are excelling, and which are not. Having this data is the only way to measure how the cows are doing."

Anything else to add?

"You need to have a plan. You have to know where you are going and follow-through on it. We have had a goal to be one of the top genetic herds in the country and we are making progress toward reaching that goal. You will not find many animals in our herd with an LPI under 3,000. Have a plan and make it happen."

The advertisement features a large blue background with the word "Cremalto" in a large, bold, white font. Below it, the text "OUR NEW INNOVATION!" is written in a bold, white font. To the right of the text is a stylized illustration of a cow with a blue body and white spots, facing left. The cow has several circular icons on its body: a gear, a brain, a plus sign, and a heart. In the top right corner, the "Selko" logo is displayed, consisting of a stylized blue and green atom-like symbol followed by the word "Selko" in a blue font. In the bottom left corner, there is a photograph of a black and white cow's head looking towards the camera, next to a block of yellow butter. Below the cow's head is the "SHUR-GAIN" logo, which is a red oval with the text "SHUR-GAIN" in white. In the bottom right corner, the "trouw nutrition" logo is shown, with "trouw" in a green font and "nutrition" in a blue font. Below "trouw nutrition" is the text "a Nutreco company" in a smaller blue font. In the center of the advertisement, the text "DISCOVER WHAT CREMALTO CAN DO FOR YOU!" is written in a blue font, with a green circular arrow icon pointing to the right.



MILK RECORDING: MAKING THE MOST OUT OF TECHNOLOGIES

Mario Séguin, Agr., Dairy Production Expert – Milk Recording and Data Management, Lactanet Canada

Data – Expertise – Solutions

Innovative technologies have never made the news so often in the Quebec dairy sector. New technologies go hand in hand with automated milking systems but also with a whole host of systems connected to control panels, sensors, and - coming soon - artificial intelligence. All these systems are aimed at increasing production efficiency, labour efficiency and cow comfort. Lactanet is working continually to develop services and tools that incorporate these new technologies to meet the ever-changing needs of Quebec dairy operations.

Lactanet is investing in optimizing an expanding amount of dairy herd data by facilitating data transfer between software programs. In 2019, major improvements were made to Ori-Automate, the software that gathers data electronically from most milking software systems, in order to collect data from software connected to the cloud computing network.

The introduction of new types of reports and unique benchmarking opportunities promises to enhance the experience of using not only milk recording data but also milking systems on farms.

Measuring performance for better management through benchmarking

Dairy producers are used to gathering production data and using that information to make management and breeding decisions. Automated milking systems collect a wide array of herd data, including milk yield per milking and per cow.

Herd data becomes more meaningful, however, when it is used for in-depth analyses or for comparisons with other producers or with the industry as a whole. Benchmarking is effective in that it allows producers to measure their performance against that of the whole dairy sector. If you don't know what the standard is, you can't compare yourself to it. To remain competitive, you

have to know where your operation stands in relation to others and know how you can go about improving it.

Those who attended the Zen & Profitable workshop held in Quebec participated in an eloquent demonstration of how benchmarking can be used to extract more information from herd data. Producers were able to compare their own milk recording data with provincial values to determine stress levels in their herds, quantify the economic impact of that stress on herd profitability, and identify potential solutions aimed at reducing it.

A new generation of milk recording reports: interactive reports

Milk recording reports in PDF format have served Lactanet clients well over the past 20 years. The new reports introduced recently by Lactanet are interactive, meaning that users can peruse their data by clicking on various tabs or herd variables and comparative analyses as needed.

The PROFILab report makes this new interactive consulting experience accessible to all dairy producers in Quebec. This report adds another tool to an interactive reporting system that includes the new Robot - Production and Efficiency report and the Hoof Health report introduced in 2019, both of which were developed with this same technology that allows interactive viewing.

The interactive reports consist of data files that are transmitted electronically. When the file is downloaded to a computer, the user can consult the data on screen through a web browser. A web connection is required to download the file, which can later be accessed offline on a computer screen, tablet or smartphone (iPhone/Android).



Work is underway to develop new interactive milk recording reports. Some of these will be available online, with more options for customizing the data display to suit the needs of each client. A team of developers at Lactanet is currently working on the visual aspect and will be consulting with users/clients.

Make the most of the technology with the new eDHI service

Lactanet is introducing a new electronic milk recording service called eDHI. The service allows remote access to herd data recorded in on-farm computer systems, without requiring a technician visit or milk sampling.

This new service is available to farms equipped with electronic milking and automatic animal identification systems (robotic and milking parlour systems). The herd averages for fat, protein, SCC and BCA in the milk recording reports are calculated from bulk tank milk

data, but the service also offers the option of collecting sensor data to establish individual cow levels.

Producers who subscribe to electronic milk recording (eDHI) must meet certain requirements for the service, including keeping accurate records in the software and properly calibrating milking systems (quantities and milk components). The service offers all the benefits of milk recording, such as calculating the HPI, and makes it easier for service providers to access herd data. Finally, herds subscribing to this service will have access to a greater number of features in the new herd genetic management tool, Compass.

This is an exciting period of technological development for dairy producers and dairy production advisors on Quebec farms. Lactanet is actively supporting the dairy industry to ensure the success of this transition, which is already well underway.



Clarke Farms Ltd.

Matthew Clarke

New Canaan, New Brunswick

Production Kgs: 13,765

Kgs Fat: 530

Kgs Protein: 448

Herd Performance Index: 919

Milk Value: \$9,529



Tell us a bit about your farm and herd. History, evolution of operation, etc.

"I took over from my Dad, Robert (and Mom, Helen) in 2003, after graduating from Nova Scotia Agricultural College. At that time, it was a small operation with 20 kgs of quota. My parents only started milking cows in 1997. Before that, they had beef, but made the switch because they believed the future was in dairy. The herd was purchased from the US and we started with some pretty poor cows – well they were not the best-looking cows, but they could milk. I had no interest in agriculture, until I started milking cows, and the rest is history. When I took over, I bought twelve more kgs of

quota and continued to slowly grow. We expanded in 2004 and again in 2011 and are at 106 kgs of quota today on 70 stalls. We have also continued to expand our capacity for heifers, building small barns as they were needed. It has sort of just evolved. We added Del Pro milking meters in 2015 which allows us to adjust feed to the cows, based on production. We built a transition barn in 2017, which has really helped our transition cow program. We farm 280 acres of farm land, with 55 acres of this being corn silage and the rest grass/legume. We have one full-time employee on the farm, Adam Chase, who has been with us since 2014. I am lucky enough to farm with the support of my wife, Gillian and my two children, Julia (12) and Lila (9)."

What are the primary goals for your farm? Areas of focus?

"My number one goal is to maximize kgs of fat per stall and to be profitable. I have no desire to build – I want to maximize the amount of quota I can fill with what I have. I will continue to work to get more efficient and purchase more quota as I need it, without having to add animals. Another important goal for me is to become a Master Breeder. We are a purebred Holstein herd and we want to continue to improve our genetics and breed beautiful, functional cows that will last."

What factors or management practices do you attribute to being a top-producing performing herd?

"We focus on the fundamentals and try to keep things simple. Our cows dropped in production in 2015 and realized our water source was an issue. We worked on a solution using the nearby river water and our production came up significantly. Sounds simple, but quality and quantity of water is so important for animal health and performance. Quality of forages is another key factor for us. You have to do what you have to do to ensure forage quality. If you have to wrap bales all night, you do it. Another key factor for us is transitions. We built a new barn in 2017 and we work to ensure our cows are comfortable and receive the proper ration. They are housed on a pack until they calve. Calf health is also a key management area for us. You have got to get them off to a good start — good quality colostrum in the first few hours and enough of it. Finally, we pay attention to the day-to-day details. We spend a lot of time in the barn. We do not miss many heats and get cows bred with when they need to be."

What do you feel are your greatest successes? Challenges?

"What I am most proud of is where we have come from. We started with such a small number of cows that were not the strongest, genetically. We have now been recognized as a top management herd and have received many superior production awards in the past number of years. To receive this type of recognition is not only satisfying, but these awards/ acknowledgements are closely linked with optimizing performance and profitability. This is what we set out to do."

Challenges? The biggest challenge in this industry is to be profitable. You have to work very hard at it. When things are not going well, it hurts and you do not want it to happen again. You need to learn from it, fix things, and get it right the next time."

Why are you a Lactanet customer? What Lactanet tools/reports do you use to help manage your herd? What do you need and expect from Lactanet to help you meet the challenges mentioned in Question 4 to ensure the future success of your operation?

"I cannot imagine managing our farm without the numbers I get from Lactanet. I need these numbers to make proper culling decisions. The key is that you have to USE the numbers. I look forward to getting the results back after every test. Fat and protein are key numbers for making mating decisions. I look at the Herd Summary report because it gives me a good snapshot of what the herd is doing. I also really like the Mobile App."

Anything else to add?

"The bottom line is that you have to give your animals everything they need to excel right from birth. I believe this is a key to success in this industry."

Your Numbers Tell a Powerful Story

“ Three years ago, I might have looked at the SCC report within 2-3 weeks of the test. With the value that my Lactanet advisor is offering now through the interpretation of the data, we look forward to the arrival of the reports and immediately review them to help manage and monitor herd performance. ”

- ROBBIE MACGREGOR, MacGregor Dairy Farm Ltd., Churchville, NS





MAXIMIZE ROBOTIC MILKING EFFICIENCY TO BOOST PROFITABILITY

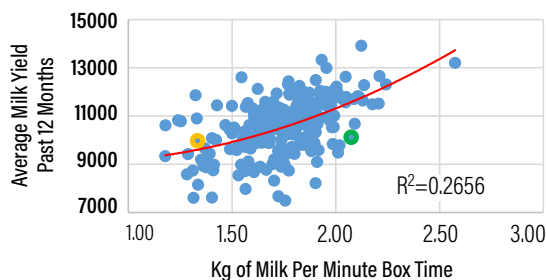
Gervais Bisson, Dairy Production Expert, Robotic Milking;
Mario Séguin, Dairy Production Expert, Milk Recording & Data Management;
Julie Baillargeon, Knowledge Transfer Expert, Lactanet Canada

On most dairy farms, increasing per-cow production improves profitability. On robotic farms, however, maximizing profit entails increasing milk production per cow as well as incorporating robotic milking efficiencies. Lactanet's new robot report is designed to provide metrics and benchmarks that facilitate herd monitoring and complement the eDHI mobile app.

Time in the Box Matters

Robotic milking efficiency is measured in kg of milk per minute of time spent in the robot (box time). One might think that as a herd's annual milk production increases, so does milking efficiency, however this isn't necessarily

12-Month Average For Milk (Kg) Per Minute Box Time



Graph 1. Variation in average milk yield for the past 12 months in relation to efficiency measured in kg of milk per minute box time (from 222 AMS Holstein herds, Lactanet, December 2019)

Yellow Farm: 1.33 kg of milk per minute box time × 1,181 minutes = 1,571 kg of milk

Green Farm: 2.07 kg of milk per minute box time × 1,181 minutes = 2,445 kg of milk

Table 1: Values Calculated to Measure Robotic Milking Efficiency

Key Indicators Robot (7 days)	Results	12 Month	Robot Provincial Average	Top 20% Robot
Avg. time/milking (min)*	7.34	7.30	7.00	7.00
Efficiency (kg milk/min robot)*	1.92	1.87	1.74	1.92
Est. max milk/robot (kg)*	2,273	2,212	2,049	2,267
Est. max fat/robot (kg)*	88.2	86.2	81.9	90.8
Milk value/cow (\$)	23.24	7,976	7,254	7,818
Milk value/robot (\$)	1,589.5	1,565.4	1,217.6	1,501.8

* Calculated value

Table 1 presents test day results and the 12-month rolling average for the four key indicators.

the case. In fact, the correlation between the 12-month average and the number of kg of milk per minute box time is only 26.6 per cent.

A robot working at full capacity (assuming 10% free-time) has a potential milking time of 1,181 minutes per day. The yellow and green dots in the graph represent two different farms. Both herds are producing an average of 10,000 kg of milk per cow per year, with milking robots working at full capacity, but the green farm is able to produce 874 kg more milk per robot. With an average feed profit margin of 0.5034 \$/kg of milk, that represents a net profit of \$440/day, or \$160,600/year for the green farm (874 kg/day × \$0.5034/kg for the Holstein breed based on the Lactanet 2020 Annual Herd Management Report).

Measuring & Monitoring Milking Efficiency

In Lactanet's Robot Report, milking time is evaluated at each test day by combining free time with a fixed factor to estimate time for cleaning, refusals and other periods during which the robot is unavailable for milking. This makes it possible to obtain comparable values among the different robotic milking systems:

1. Average milking time in minutes;
2. Milking efficiency in kg of milk per minute (box time);

Projections based on actual results are also provided:

3. Maximum milk yield per robot (in kg) at full capacity;
4. Maximum fat yield per robot (in kg) at full capacity.

Estimated maximum milk/robot is calculated assuming 10% free-time. Since improving efficiency is an ongoing process, you can start work immediately if the projected maximum doesn't meet your expectations.

Selecting top performing animals certainly contributes to improving robot efficiency, but management factors also play a part.

Incomplete Milkings

Incomplete and failed milkings probably have the greatest impact on efficiency and when they begin to increase, the free-time decreases. This factor should be prioritized.

Preparation Time

Both the robot (equipment failure, dirty camera lens, etc.), and the cows (poor udder conformation, bad temperament, long hair, etc.), influence preparation

Robot — Production and Efficiency

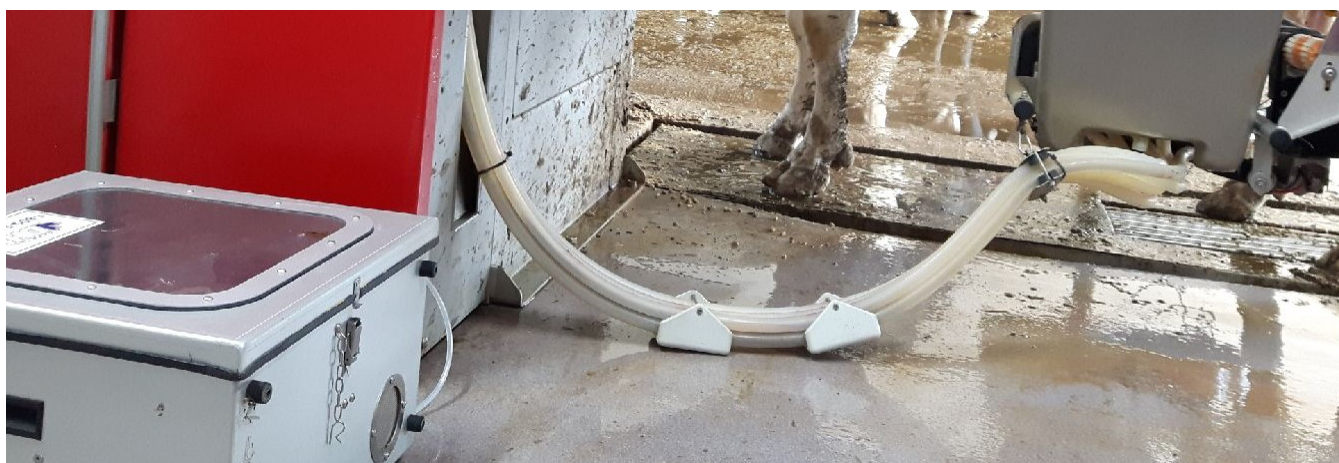
Key Herd Indicators	Test Day	12 Mths	Robot Provincial Average	Top 20% Robot
Number of Cows	127	135.6	103.4	101.2
Cows in Lactation	107	113.0	89.4	86.7
Daily Milk (kg)	39.1	37.8	32.8	36.3
Standard Milk (kg)	41.2	42.3	37.3	40.4
Annual Milk (kg)	—	11,537	10,356	11,335
Daily Fat (kg)	1.51	1.50	1.32	1.44
Fat (%)	3.86	3.97	4.09	3.99
Daily Protein (kg)	1.28	1.24	1.10	1.19
Protein (%)	3.27	3.29	3.40	3.30
Avg DIM	176	167	174	165
Peak Milk (kg)	46.9	47.0	41.9	45.6
Peak DIM	54	55	48	48
Herd Avg SCC ('000)	137	251	221	184

***The NEW Robot Report is Dynamic:** The traditional PDF report is now replaced with a dynamic data file, which allows you to view your data by clicking between two tables and eight graphs to help you evaluate milking efficiency.*

time (teat cleaning, teat cup attachment, etc.), which is included in milking time. Proper robot maintenance and keeping hair short on the mammary gland will save time.

Late-lactation

Late-lactation cows can be a source of inefficiency, as the udder at this stage contains less milk and teats are closer together. This complicates teat attachment and increases milking failures. Consider dry-off for cows producing less than 15 kg of milk/day.



BENCHMARKS: MILKING ROBOTS, PREDOMINANT BREED HOLSTEIN (DECEMBER 31, 2019)

	Atlantic		Quebec		Ontario		West		Canada	
	Robot	Total ¹	Robot	Total ¹	Robot	Total ¹	Robot	Total ¹	Robot	Total ¹
Number of herds	34	272	275	2,956	272	2,186	151	736	732	6,150
Number of cows per herd	108.1	104.0	104.1	74.5	113.0	90.9	166.0	182.7	120.4	94.6
Annual milk (kg/cow/year)	10,993	9,867	10,469	9,906	10,908	10,022	11,096	10,533	10,786	10,021
Annual fat (kg/cow/year)	444	400	421	404	432	398	444	427	432	404
Annual fat (%)	4.03	4.06	4.00	4.08	3.96	3.98	3.99	4.05	3.99	4.04
Annual protein (kg/cow/year)	368	327	351	333	360	329	367	347	359	333
Annual protein (%)	3.33	3.31	3.33	3.36	3.31	3.29	3.30	3.30	3.31	3.33
305-day milk (kg)	11,016	10,037	10,398	9,997	10,952	10,177	11,314	10,741	10,821	10,152
305-day fat (kg)	437	401	414	400	426	398	443	429	426	403
305-day fat (%)	3.96	3.99	3.96	4.01	3.89	3.92	3.91	4.00	3.92	3.97
305-day protein (kg)	362	327	345	330	355	329	367	348	355	332
305-day protein (%)	3.28	3.26	3.30	3.30	3.25	3.23	3.24	3.24	3.27	3.27
Days at peak	46	43	46	44	50	46	57	54	50	46
Peak milk (kg)	44.3	39.2	42.3	39.7	43.7	40.0	44.2	41.7	43.3	40.1
Lactation persistency	96	97	96	96	97	97	99	98	97	97
Annual Transition Cow Index®	461	136	410	207	—	—	—	—	415	201
Longevity (% 3 rd lactation +)	38.7	38.5	38.7	41.5	36.3	36.1	34.0	34.6	36.8	38.6
Age at 1 st calving (mo.)	25.4	26.3	25.0	25.4	24.9	25.5	25.4	25.4	25.1	25.5
Herd age at calving (mo.)	44.7	46.6	44.4	46.6	43.0	44.1	43.4	43.4	43.7	45.3
Herd turnover (%)	34.7	40.3	36.0	35.9	39.2	39.5	40.8	40.5	38.1	37.9
Mortality (%)	3.0	3.4	5.3	5.2	5.6	5.6	8.9	7.8	6.0	5.6
Disposal for feet/legs (%)	2.9	2.9	3.1	2.8	2.1	2.1	2.9	2.7	2.7	2.5
Disposal for reproduction (%)	7.0	7.1	6.3	6.2	5.9	7.1	5.4	6.2	6.0	6.6
Disposal for mastitis/high SCC (%)	4.1	4.4	3.8	4.4	2.1	3.6	4.1	3.9	3.2	4.0
Sold for milk production (%)	1.4	6.9	2.6	3.0	7.9	8.2	5.2	5.8	5.1	5.3
Calving interval (days)	413	422	404	414	408	420	422	420	409	417
Days to 1 st breeding	87.4	87.6	73.4	75.9	80.3	81.3	91.6	89.1	80.4	79.9
Days dry	68.4	72.3	64.2	63.8	69.0	69.2	69.9	72.9	67.4	67.2
Annual SCC ('000/ml)	201	192	190	202	213	222	216	208	204	209
Annual Milk value (\$)	8,053	7,242	7,759	7,366	7,799	7,223	8,019	7,718	7,845	7,352
Herds with feed	1	27	53	705	—	—	—	—	54	732
Annual feed cost (\$)	—	2,294	2,503	2,342	—	—	—	—	2,500	2,341
Margin over feed cost (\$)	—	4,714	5,259	5,031	—	—	—	—	5,271	5,028
Feed cost (\$/hl)	—	25.36	25.80	24.83	—	—	—	—	25.77	24.82

¹ Number of herds with a known milking system.

THE FUTURE OF MILK ANALYSIS — FATTY ACID PROFILE

Déborá Santschi, Director of Innovation & Development;
Daniel Warner, Research & Data Analysis Professional;
Julie Baillargeon, Knowledge Transfer Expert, Lactanet Canada



Lactanet's innovation and lab teams have devoted four years to developing, fine-tuning, validating and standardizing the milk fatty acid (FA) profile, also known as PROFILab. Similar analysis has been available in select American labs using different analysers, however working with Foss, a Danish lab equipment manufacturer, and world-renowned experts, Rachel Gervais and Yvan Chouinard, predictive algorithms were refined based on real cow metabolism and the precision of the analysis was improved.

First the Bulk Tank

In the first phase of implementation, PROFILab analysis is available for bulk tank milk samples. Producers can view fatty acid (FA) information on-line alongside milk components. Benchmarks will be displayed to help interpret the results and for herds on milk recording,

more detail is available for different breeds, production levels and housing types.

Herd values depend on breed, diet, production, season and other herd management and environmental factors. For that reason, comparisons with similar herds are the best way to find out where a herd stands in relation to its potential.

The PROFILab service is currently being introduced by Lactanet in the province of Quebec and will become available to the rest of the country over time.

The next phase of development involves applying the concept to individual cows for a better picture of a cow's energy and rumen health, particularly in early lactation.

De Novo FAs Increase Component Levels

De novo FA levels are an indicator of rumen health, so this should be the first group of fatty acids to focus on. High levels of *de novo* FAs are a sign of good rumen health, but also suggest that the cows could be “pushed” for a little extra milk.

Data in Quebec confirms that *de novo* fatty acids (alone or with mixed FAs) have the strongest relationship to milk fat and protein. Hence, boosting the synthesis of *de novo* FAs will have a positive effect on components. Adequate fibre, enough degradable protein and encouraging several feedings per day, are all factors that have a positive impact on *de novo* FAs.

FAs and Rumen Health

A bulk tank FA profile of milk every second day provides useful information that assesses rumen health in the herd and ration utilization. Low *de novo* levels indicate that the rumen is not functioning properly and the cow may be suffering from ruminal acidosis (lower than average fat @ 3.6-3.8 kg/hL). If that is not the case, then there may be a shortage of available nutrients, which would disrupt the normal functioning of the rumen and, consequently, the synthesis of *de novo* fatty acids.

Mixed FAs often follow *de novo* FAs (indicating synthesis in the mammary gland) or will increase substantially when a feed with high palm oil content is added to the diet. A bulk tank urea analysis will confirm which of the two nutrients is in short supply. If the ration is modified during certain periods of the year, the effect can be seen rapidly even if total fat has remained the same.

Consulting the FA profile once a week when all is well, and more often when there is a problem or a change has been made, is a sound strategy. Eventually, the report could automatically notify and alert producers of changes in the herd’s status.

A milk sample tells a story that goes beyond analyzing components, verifying pregnancy and detecting disease. Fatty acid profile analysis reflects rumen health and producers can use this information to adjust their herd rations or feed management practices.

Working With PROFILab Results

In addition to support from advisors, notes, and monitoring of changes to feeding or management practices are the best allies in getting the most out of this new tool.

The FA profile can highlight any number of changes that could be undetected: a change in forage that went unnoticed, too many cows in the high-production group, an error in the mixer on a busy morning, a ration that looked ideal on paper.

Innovative Herd Management

The FA profile contains a wealth of information that can be used to optimize rations and herd potential. Globally, Lactanet is the first to offer this to producers and link it to milk recording performance and demographic data for benchmarks. This information is extracted from milk samples that are already collected and analyzed to support dairy producers in herd management.

FATTY ACIDS IN MILK

Milk contains roughly 400 different FAs, but most of them occur in extremely low concentrations. The main FAs can be quantified with an infrared analysis, at the same time as regular milk components (fat, protein, urea, lactose, SCC, etc.).

In six seconds, we now see the total composition of a milk sample, including the main FAs:

- **De novo FAs:** indicators of rumen health. These short-chain FAs (14 or fewer carbons) are synthesized in the mammary gland from butyrate and acetate, two volatile FAs that derive from ruminal fermentation;
- **Mixed FAs:** 50% are synthesized in the mammary gland and 50% come from feed or body fat reserves. These FAs all comprise 16 carbons and levels increase when palm-oil-based products, for example, are added to the ration;
- **Preformed FAs:** long-chain FAs (15-17+ carbons) that reflect fat intake (contained in forages, corn, concentrates, soybeans, etc.) or the mobilization of body fat reserves (high in early lactation).



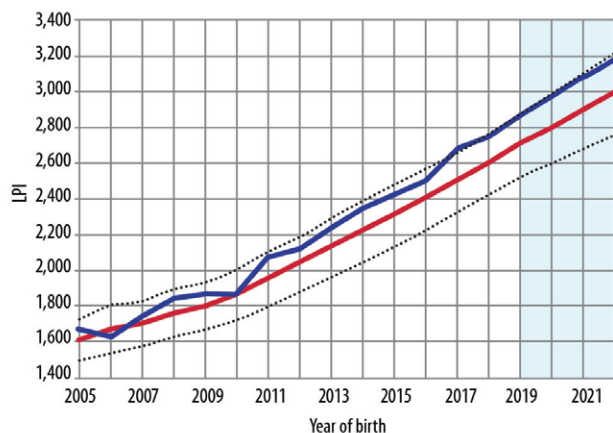
COMPASS – INNOVATION FOR HERD MANAGEMENT

Mario Séguin, Dairy Production Expert, Milk Recording & Data Management, Lactanet Canada

In November 2019, Lactanet and Holstein Canada jointly announced they were launching Compass, an online software system that offers a range of tools to help producers manage their herd genetics. After only four months of operation, over 1,500 user accounts have been created! This strong show of interest confirms the appeal of a genetic management tool made available free of charge to all Canadian dairy producers. Here is an overview of the features and benefits of Compass.

Benchmarking for improvement

The Past Breeding Success module provides graphs for LPI, Pro\$ and over 40 production, conformation and functional traits. The graphs allow users to see how their herd improvement ranks in relation to all the herds in Canada. Producers can easily check percentile rankings and past genetic gains in their herds over a time period of their choosing.

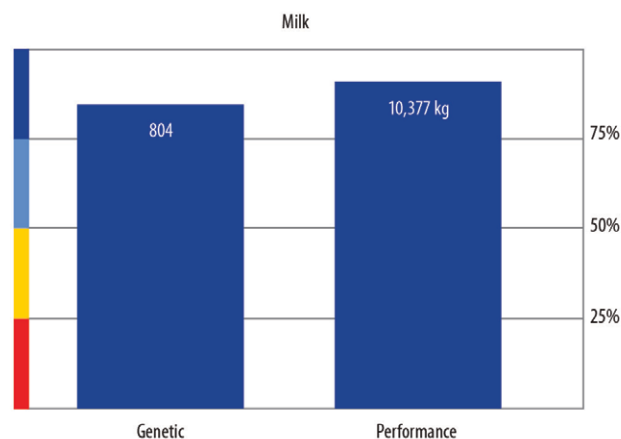


Graph 1: This graph from the Past Breeding Success module makes it possible to rank a herd (blue line) in relation to other Canadian herds (red line) for more than 40 selection criteria.

Herd genetics vs herd performance

The Herd Genetics module includes a number of features designed to establish a personalized breeding strategy and monitor genetic improvement in a herd. One frequently used feature presents graphs that

compare genetic levels relative to the performance of young cows in the herd. Herd-specific management recommendations can be derived from these graphs.



Graph 2: The graphs for genetic level versus annual production for young cows in the herd allow producers to see how the the genetic level of their young cows is expressed in their performance.

Maximize the return on genetic investments

In the Strategy and Profitability module, the proposed investments in genetics are intended to reflect the most lucrative values and quantify the investment returns, expressed in dollar terms. To do this, the software allows users to personalize herd data. In calculating the most profitable strategies, the software also takes into account a number of other considerations:

- Genotyping costs can be optimized: by targeting heifers and unborn calves for genotyping, not all females will need to be genotyped to improve the herd;
- Using sexed semen is an efficient way to improve herd genetics: genetic improvement can be maximized by selecting the cows that will become dams to replacement animals. These are the cows worth inseminating with sexed semen. The software seeks to make best use of sexed semen;

- Some of the females in the herd can be inseminated with beef semen, since the use of sexed semen ensures there will be a sufficient number of replacement animals. Crossbred calves are usually a good source of farm income;
- Using top-ranking genomic sires generates the highest genetic gains and enhances herd performance.

Additional features that make this software unique:

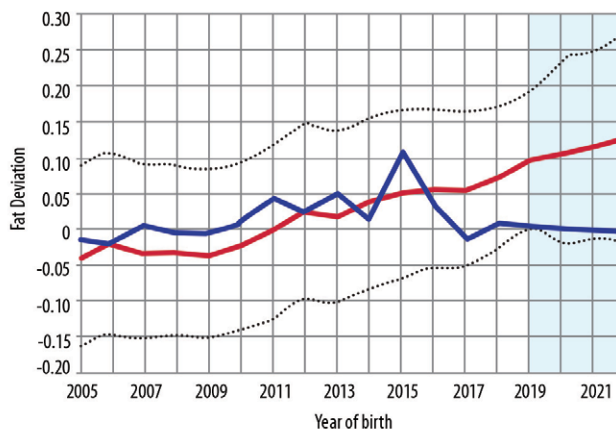
1. Insemination data collected through milk recording is incorporated into the graphs and strategies, and the software generates a list of calvings expected to occur over the next four months. The software can thus propose management decisions relevant to the soon-to-be-born heifers. The genetic values for the pregnancies in progress are used to extrapolate the herd's future genetic values on the graphs.
2. The software calculates the probabilities that the females in the herd will be carriers of various undesirable haplotypes. Undesirable haplotypes and recessive genes can affect reproductive efficiency and herd profitability. The home page for each specific herd identifies the haplotype that is the most likely to occur in order to guide selection strategies for the herd and reduce economic losses associated with haplotypes.
3. The most recent monthly evaluations of all females in the herd are accessible, both officially published values and herd management values. The values for each female in the herd can be accessed on a new Web page called Compass.
4. The software helps producers choose the best selection index (LPI or Pro\$) for their herd, based on their goals and expected gains according to each index.
5. It creates lists of the best sires according to specific criteria, such as sire category, supplier (AI centres) or targeted genes.

Some examples of management guidelines taken from Compass:

1. Improve milk value according to the market

In January 2020, a press release from Les Producteurs de lait du Québec announced an important change to the milk payment system that will mean higher milk prices for producers whose herds have lower SNF/BF

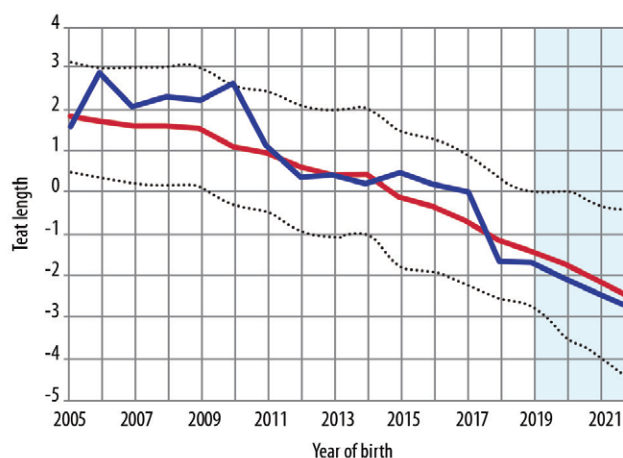
ratios. Maintaining optimal fat levels in the herd is thus a priority. Because fat content has a strong genetic component, it is also important to monitor this trait in the genetics of the herd.



Graph 3: Variations in the fat deviation by year of birth of the cows in the herd reflect past breeding decisions and allow producers to make adjustments in line with expected milk revenue.

2. Adapt conformation to the milking system

Canadian farms are equipped with a variety of milking systems (milk lines, milking parlours, robotic milkers) and certain types of cows can be more efficient than others depending on the system used on the farm. Teats of medium length (not too short) are preferable with robotic milking systems. The graph showing variations in teat length may indicate that a change in selection strategy aimed at increasing teat length would be advantageous for a herd in a particular type of facility.



The number of accounts created in the few months since the launch of this software suggests that Compass is off to a great start. Proposed improvements will be incorporated into a new version of Compass that will be made available later this year. There is no doubt that Compass is proving to be an innovative tool for Canadian farmers looking to improve the profitability of their herds.



2019 STATISTICS

PORTRAIT OF PERCENTILE RANKS FOR ALL ATLANTIC HERDS BASED ON 2019 HERD AVERAGES (294 HERDS)

	Maximum*	90	80	70	60	50	40	30	20	10
Milk Value/Holstein (\$)	> 10,776	8,960	8,412	7,860	7,580	7,278	6,966	6,462	6,161	5,659
POINTS	500	469	422	332	274	215	161	94	67	36
Milk Value/Colored Breeds (\$)	*	7,343	6,747	6,502	6,262	5,971	5,689	5,410	4,897	4,710
POINTS	500	451	377	330	286	238	179	135	63	48
Udder Health	<1.5	1.8	2.0	2.1	2.2	2.3	2.5	2.6	2.8	3
POINTS	150	141	129	121	111	100	77	65	45	27
Calving Interval (days)	<22.1	23.5	24	24.8	25.4	25.9	26.6	27.3	28.7	30.7
POINTS	100	88	77	57	42	31	22	16	8	4
Calving Interval (months)	<396	390	397	402	409	417	426	433	443	462
POINTS	48	50	48	43	35	27	20	15	10	6
Longevity (%)	49.7 - 54.5	50	46.1	43.6	41.0	39.4	37.1	34.7	32.3	29.0
POINTS	100	100	91	79	64	54	41	30	21	11
Herd in Milk (%)	86.2 - 90.2	89.9	88.6	87.7	86.9	86.4	85.5	84.4	82.9	80.5
POINTS	100	100	100	100	100	100	80	63	38	33

* No maximum value is included as no herds received the maximum score in the group of herds being benchmarked.

PROVINCIAL STATISTICS

HERD PERFORMANCE INDEX (HPI) TOP 10 SCORES OF ATLANTIC PROVINCES

NEW BRUNSWICK								
Rank	Farm Name	Points for Milk Value	Points Linear Score	Points Calving Age	Points Calving Interval	Points Longevity	Points for Cows in Milk in Herd	Herd Performance Index
1	Clarke Farms	490	121	87	41	80	100	919
2	Willie Leblanc & Sons Ltd	478	121	87	45	24	100	855
3	Lawrence's Dairy Farm Ltd	493	129	53	43	27	100	845
4	Ravenwood Holsteins Ltd	482	100	59	45	55	100	841
5	Walkerville Farms	462	121	81	27	50	68	809
6	Hazelhill Farms	440	121	51	50	45	100	807
7	Pascobac Holsteins Inc	396	150	77	50	29	100	802
8	Presstein Holsteins	469	136	15	50	29	100	799
9	Waddy & Colpitts Ltd	376	129	90	45	43	100	783
10	Clearland Holsteins	383	111	51	48	89	90	772

NOVA SCOTIA								
Rank	Farm Name	Points for Milk Value	Points Linear Score	Points Calving Age	Points Calving Interval	Points Longevity	Points for Cows in Milk in Herd	Herd Performance Index
1	Sunny Point Farms Ltd	493	150	98	43	99	63	946
2	MacGregor Dairy Farm Ltd	500	129	84	50	58	100	921
3	Black Avon Farms Ltd	471	150	94	48	58	100	921
4	Lone Willow Farm	474	145	59	50	90	100	918
5	A & J Bent Farms Ltd	413	149	93	50	100	98	903
6	Dalhousie University Agr Campus	439	149	96	50	68	100	902
7	West River Holsteins	464	121	100	50	41	100	876
8	Kipawo Holsteins 2011 Ltd	489	55	92	50	85	72	843
9	Holmstein Farm Ltd	478	121	86	22	58	77	842
10	Sparklingdew Holsteins	436	121	29	50	98	100	834

PROVINCIAL STATISTICS

HERD PERFORMANCE INDEX (HPI) TOP 10 SCORES OF ATLANTIC PROVINCES

PRINCE EDWARD ISLAND								
Rank	Farm Name	Points for Milk Value	Points Linear Score	Points Calving Age	Points Calving Interval	Points Longevity	Points for Cows in Milk in Herd	Herd Performance Index
1	Jewell Dale Farm Inc	491	141	79	50	96	100	957
2	Tiny Acres Holsteins	497	150	97	50	1	100	895
3	Carruthers Farms Ltd	496	141	87	50	14	87	875
4	Reeves Farm Inc	489	121	65	48	59	77	859
5	Red Oak Farms	433	141	99	40	8	100	821
6	Crasdale Farms	487	89	92	34	10	100	812
7	Karma Farms	427	145	46	50	83	50	801
8	Pondsedge Holsteins	451	121	72	28	14	100	786
9	Dock Road Dairy	473	111	56	32	10	100	782
10	Abelaine Farms Inc	400	150	85	46	12	81	774

NEWFOUNDLAND								
Rank	Farm Name	Points for Milk Value	Points Linear Score	Points Calving Age	Points Calving Interval	Points Longevity	Points for Cows in Milk in Herd	Herd Performance Index
1	Sunrise Dairy Ltd	491	136	97	48	6	100	878
2	Larch Grove Farms	470	111	57	39	39	100	816
3	N & N Farm Ltd	450	100	56	46	78	62	792



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PROVINCIAL STATISTICS

PROVINCIAL 305-DAY PRODUCTION AVERAGE

Province & Service Level	Herds	Milk (kg)	Fat (kg)	Protein (kg)	BCA M	BCA F	BCA P	Avg BCA
NEW BRUNSWICK								
Publishable	80	9,552	389	315	221	232	226	226.5
All	106	9,331	375	304	216	223	217	218.7
NOVA SCOTIA								
Publishable	117	9,873	397	325	222	235	228	228.1
All	87	10,174	406	334	227	240	233	233.5
PRINCE EDWARD ISLAND								
Publishable	74	10,041	406	328	225	243	230	232.9
All	91	9,914	400	323	222	239	227	229.2
NEWFOUNDLAND								
Publishable	5	11,008	457	357	247	276	251	258.2
All	6	10,380	426	337	231	256	235	240.6

* For AY, HO and JE breeds, a minimum of 10 publishable lactations is required for a publishable herd average. All other breeds require 5.

ANNUAL PROVINCIAL HERD DEMOGRAPHICS - ALL HERDS

Herd Size (cows)	Herds %	Animals %	Average Herd Size	Average Milk Production	Average Fat Production (kg)	Average Fat Production (%)	Average Protein Production (kg)	Average Protein Production (%)	Average SCC ('000/ml)
NEW BRUNSWICK									
1-39	7.8	2.1	28	8,124	339	4.25	277	3.44	179
40-79	50.0	28.6	60	8,751	351	4.03	285	3.26	202
80-119	16.7	15.5	98	9,694	397	4.11	326	3.37	187
120+	25.5	53.8	221	10,289	425	4.14	342	3.33	202
NOVA SCOTIA									
1-39	8.0	2.2	27	7,627	317	4.20	257	3.40	209
40-79	44.2	25.5	58	9,354	381	4.08	313	3.36	201
80-119	24.8	23.7	96	9,522	379	3.96	317	3.33	244
120+	23.0	48.7	212	11,222	467	4.18	374	3.33	167
PRINCE EDWARD ISLAND									
1-39	6.7	2.6	34	7,763	325	4.17	258	3.31	196
40-79	52.8	35.8	60	9,324	384	4.12	308	3.31	191
80-119	24.7	27.1	97	9,888	408	4.13	331	3.34	167
120+	15.7	34.4	193	11,365	458	4.04	377	3.32	167

QUEBEC HOLSTEIN HERD STATISTICS BASED ON MILK PRODUCTION¹ - FEED EFFICIENCY

Production (20% ranking)	0-20 ²	21-40	41-60	61-80	81-100	Total/Average
Number of herds	594	593	593	593	593	2,966
Number of cows in the herd	60.8	67.6	70.7	77.3	91.9	73.7
PRODUCTION						
Milk (kg/cow/year)	7,860	9,298	9,984	10,643	11,697	9,896
Butterfat (kg/cow/year)	325	380	409	433	472	404
Butterfat (%)	4.14	4.09	4.09	4.06	4.04	4.09
Protein (kg/cow/year)	265	313	336	358	391	333
Protein (%)	3.37	3.36	3.37	3.36	3.34	3.36
SCC ('000 c.s./ml)	250	212	202	183	178	205
Linear score	2.7	2.4	2.4	2.2	2.2	2.4
Corrected milk ³ (kg/cow/day)	29.4	34.0	36.2	38.3	41.7	35.9
DEMOGRAPHICS						
Culling (%)	35.4	35.1	35.3	36.4	37.7	36.0
Voluntary cull ⁴ (%)	4.6	5.0	5.8	6.7	8.2	6.1
Involuntary cull ⁴ (%)	18.8	20.6	20.0	21.4	21.2	20.4
Cows in lactation (%)	86.1	86.7	86.8	87.1	87.4	86.8
3 rd lactation + (%)	41.6	41.3	41.9	41.9	40.9	41.5
Average age (year-month)	4-1	3-10	3-10	3-9	3-8	3-10
Average bodyweight (kg)	664	680	684	693	704	687
Age at 1 st calving (months)	27.2	25.6	25.1	24.8	24.5	25.5
Bodyweight at 1 st calving (kg)	613	631	633	642	652	637
REPRODUCTION						
Calving interval (days)	433	416	411	407	405	414
Days in milk at 1 st breeding	83	76	75	74	76	77
Breeding/cow/year	2.14	2.21	2.24	2.27	2.26	2.22
Days dry	67	64	64	63	61	64
Days open	153	136	131	127	125	134
Milk value (\$/cow/year) (all herds)	5,973	6,942	7,421	7,874	8,593	7,360

QUEBEC HOLSTEIN HERD STATISTICS BASED ON MILK PRODUCTION¹ - FEED EFFICIENCY

CONTINUED

Production (20% ranking)	0-20 ²	21-40	41-60	61-80	81-100	Total/Average
FEED AND COSTS						
Number of herds with feed	132	132	132	132	131	659
Milk value (\$/cow/year) (herds with feed)	6,134	7,011	7,475	7,860	8,474	7,389
Milk (kg/cow/year) (herds with feed)	8,243	9,446	10,064	10,608	11,533	9,976
Margin over feed cost (\$/cow/year)	3,945	4,707	5,121	5,439	5,970	5,035
Feed cost (\$/hl)	26.92	24.94	23.99	23.63	23.15	24.53
Forage cost (\$/cow/day)	2.91	2.99	3.07	3.09	3.14	3.04
Concentrates cost (\$/cow/day)	2.82	3.06	3.17	3.34	3.71	3.22
Minerals, vitamins & additives cost (\$/cow/day)	0.30	0.34	0.33	0.37	0.40	0.35
Forage milk ⁵ (kg/cow/year)	3,002	3,557	4,112	4,181	4,807	3,977
Forage (kg dry matter/cow/year)	5,110	5,359	5,532	5,702	5,839	5,508
Concentrates (kg dry matter/cow/year)	2,389	2,588	2,566	2,711	2,826	2,616
Total dry matter intake (kg/cow/year)	7,498	7,947	8,098	8,414	8,666	8,124
Energy supplement (kg dry matter/cow/year)	1,843	1,907	1,790	1,839	1,858	1,847
Protein supplement (kg dry matter/cow/year)	545	682	776	872	969	768
Feed efficiency ⁶	1.13	1.22	1.28	1.31	1.36	1.26
Standard milk/concentrates ratio ⁷	3.13	3.29	3.50	3.51	3.59	3.40
Concentrates cost (\$/hl)	13.90	13.23	12.75	12.87	13.05	13.16
Milk value (\$/hl)	76.74	76.52	76.58	76.39	75.75	76.39
Margin over feed cost (\$/hl)	49.82	51.58	52.58	52.76	52.60	51.87
Margin over feed cost (\$/kg butterfat)	11.75	12.24	12.47	12.57	12.68	12.34

¹ Valacta customers (Quebec), with validated data for the 12 months ending at the last test prior to December 31, 2019.

² The 0-20 ranking gives the average of the 20% of herds with the lowest milk production, etc.

³ Corrected milk is adjusted to 2nd lactation, 150 days in milk, 4.0% fat and 3.35% protein.

⁴ The category "Other" is excluded from these fields.

⁵ Based on energy and protein.

⁶ The calculation (standardized milk kg/dry matter kg) includes all cows (not just milking cows).

⁷ As fed.

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ATLANTIC HOLSTEIN HERD STATISTICS BASED ON MILK PRODUCTION LEVEL (AVERAGE BY 20% MILK PRODUCTION GROUPS)

Production (20% ranking)	0-20	21-40	41-60	61-80	81-100	Total/Average
Number of herds	56	57	57	57	57	284
Number of cows in the herd	66.9	81.4	90.3	123.2	170.3	106.6
Milk (kg/cow/year)	7,566	8,985	9,964	10,926	12,499	9,997
Butterfat (kg/cow/year)	303	363	408	446	506	406
Butterfat (%)	4.00	4.04	4.09	4.09	4.05	4.05
Protein (kg/cow/year)	250	298	329	364	412	331
Protein (%)	3.30	3.31	3.31	3.33	3.30	3.31
SCC ('000 c. s./ml)	233	206	181	175	170	193
Linear score	2.6	2.4	2.3	2.2	2.1	2.3
Corrected milk ¹ (kg/cow/day)	28.2	32.9	36.2	39.6	44.5	36.3
Culling (%)	38.8	36.2	39.2	47.8	39.4	40.3
Voluntary cull ² (%)	10.5	8.0	7.1	18.9	10.0	10.9
Involuntary cull ² (%)	19.6	22.1	24.6	23.4	22.8	22.5
Cows in lactation (%)	85.1	84.8	85.7	86.5	87.1	85.8
3 rd lactation + (%)	39.9	40.1	37.3	37.4	37.6	38.4
Average age (year-month)	4-2	4-0	3-9	3-8	3-7	3-10
Age at 1 st calving (months)	29.1	27.2	25.9	25.1	24.3	26.3
Calving interval (days)	453	429	420	407	405	423
Days in milk at 1 st breeding	103	92	88	82	79	89
Breeding/cow/year	1.78	1.99	1.97	2.01	2.10	1.97
Days dry	77	80	73	68	64	72
Days open	173	149	140	127	125	143
Milk value (\$/cow/year)	5,488	6,572	7,318	8,086	9,090	7,317

¹ Corrected milk is adjusted to 2nd lactation, 150 days in milk, 4.0% fat and 3.35% protein.

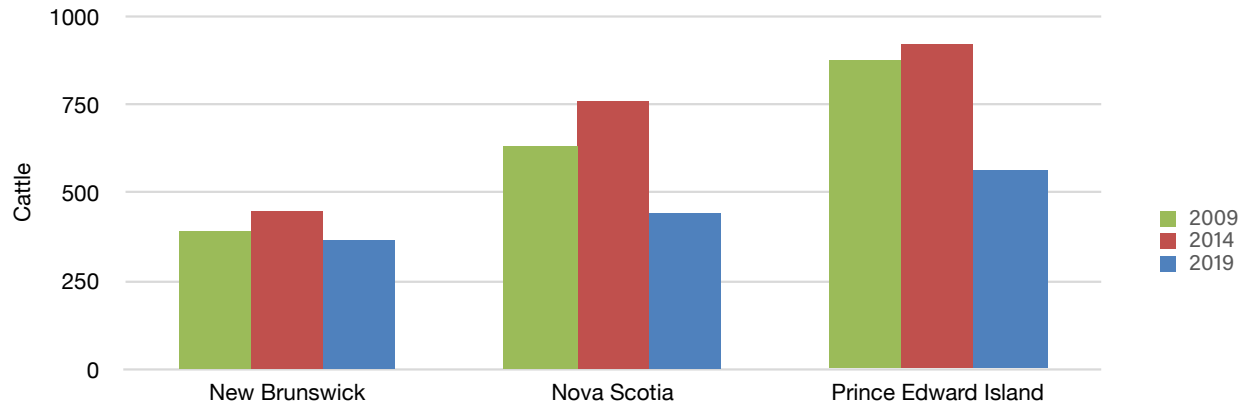
² The category of OTHER is excluded from this field.

MANAGEMENT CENTER BENCHMARKS

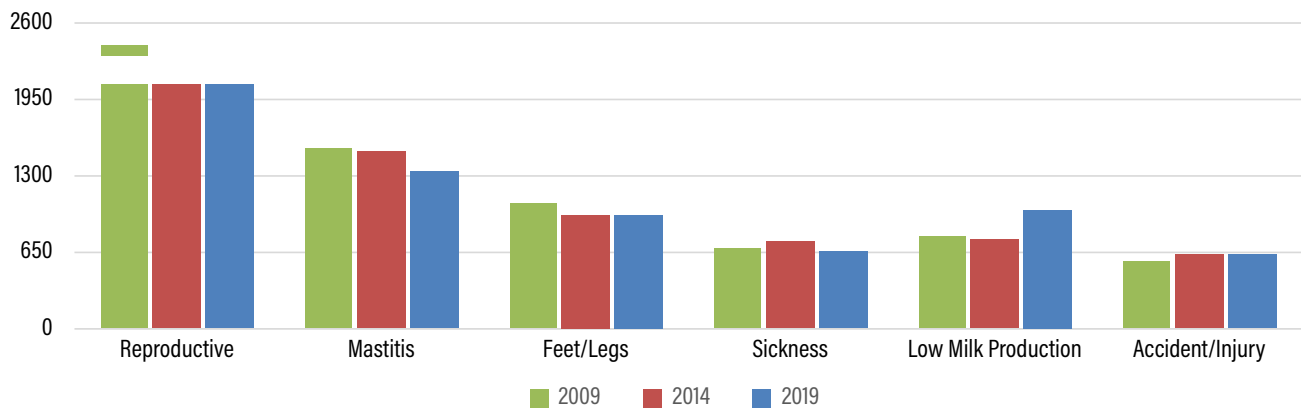
	NEW BRUNSWICK				NOVA SCOTIA				PRINCE EDWARD ISLAND				NEWFOUNDLAND			
Measure	Percentile				Percentile				Percentile				Percentile			
	25 th	50 th	75 th	90 th	25 th	50 th	75 th	90 th	25 th	50 th	75 th	90 th	25 th	50 th	75 th	90 th
Annual Milk Value (\$)	5,926	6,826	7,652	8,398	6,200	7,177	8,357	9,057	6,167	7,119	7,738	8,497	6,664	9,482	10,293	10,846
Somatic Cell Count ('000/ml)	288	245	195	141	313	238	197	144	285	213	168	130	215	194	159	138
Udder Health (SCC Linear Score)	3.0	2.8	2.4	2.1	3.0	2.7	2.3	2.0	2.9	2.6	2.3	2.0	2.3	2.3	2.2	2.0
Age at 1 st Calving (Year-Month)	2-6	2-4	2-2	2-0	2-6	2-3	2-1	2-0	2-6	2-4	2-2	2-0	2-3	2-1	2-0	1-11
Calving Interval (months)	14.9	14.1	13.3	13.0	15.3	14.2	13.6	13.0	15.3	14.4	13.8	13.1	14.8	13.7	13.0	12.9
Longevity (% of herd in 3 rd + lactation)	36	42	48	53	35	40	45	49	30	34	41	46	26	37	40	50
Herd Efficiency (% of herds in milk)	85	87	89	91	84	86	88	90	83	86	87	90	85	87	90	90
Herd Turnover (% of herds in removed)	27	34	41	48	29	37	43	50	32	40	48	61	55	50	49	39
Number of Cows	55	69	114	184	53	73	111	165	53	72	97	127	114	203	218	227
Management Milk (kg)*	29	33	38	42	31	36	40	45	32	36	39	44	29	40	42	44
Days Dry	90	75	64	57	99	78	67	59	112	93	71	61	84	68	62	58
Days to 1 st Breeding	108	96	85	78	108	96	84	76	113	99	83	73	128	90	78	69

* Management milk measure: brings age, stage of lactation and energy-corrected milk to a standard number for comparison purposes.

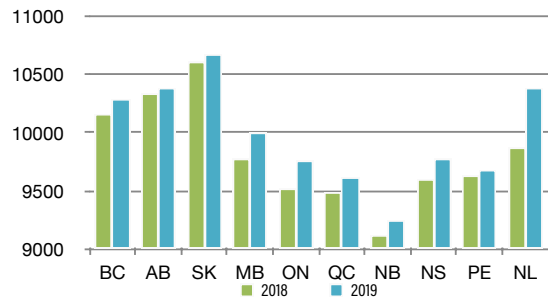
NATIONAL STATISTICS



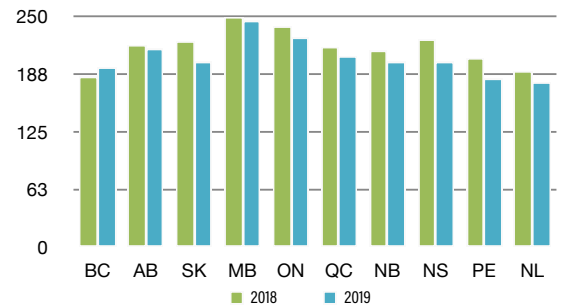
LIVE CATTLE MOVEMENT



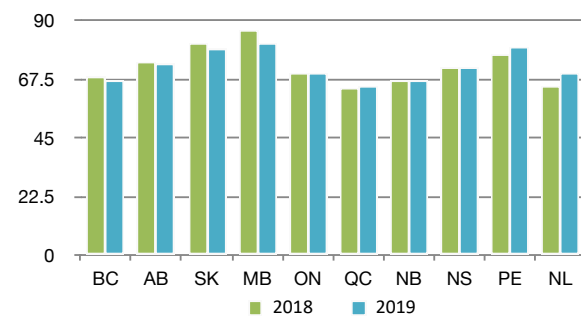
TOP DISPOSAL REASONS



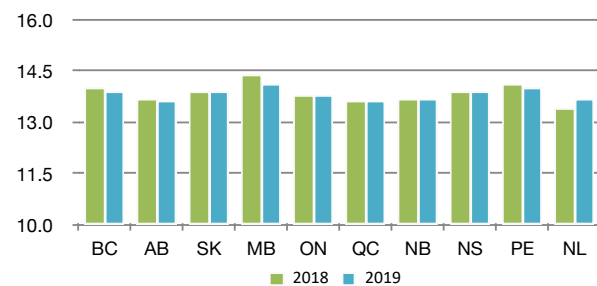
MILK PRODUCTION (KG) PER COW PER PROVINCE



SOMATIC CELL COUNT ('000) AVERAGE BY PROVINCE



DRY PERIOD (DAYS) AVERAGE BY PROVINCE



CALVING INTERVAL (MONTHS)

NATIONAL STATISTICS

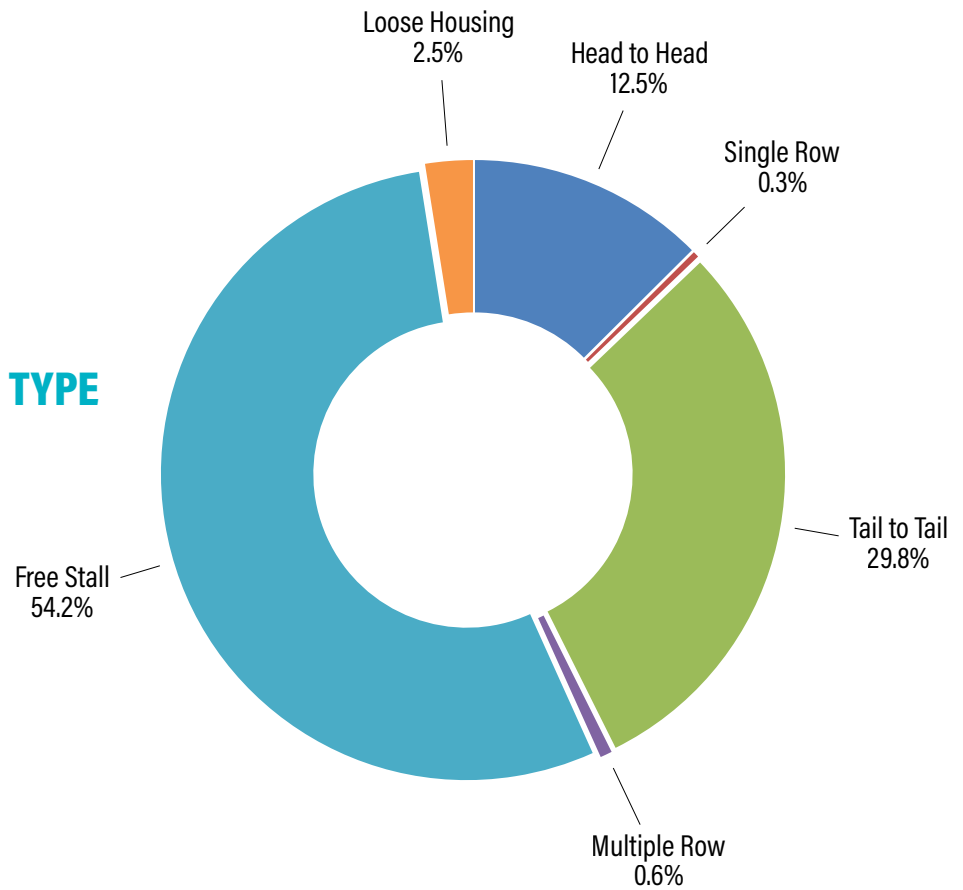
DAIRY HERD STATISTICS BY PROVINCE

Province	Recorded Herds		Recorded Cows		Average Herd Size		"% Herds > 100 Cows"	% Recorded Herds
	2018	2019	2018	2019	2018	2019		
Newfoundland	6	6	1,093	1,177	182.2	196.2	83	24.1
Prince Edward Island	91	89	8,539	7,803	93.8	87.7	24	57.2
Nova Scotia	120	112	11,761	11,348	98.0	101.3	33	57.7
New Brunswick	107	102	11,535	10,906	107.8	106.9	34	65.3
Quebec	3,781	3,403	260,688	249,917	68.9	73.4	16	72.6
Ontario	2,557	2,430	227,776	220,784	89.1	90.9	26	71.5
Manitoba	157	154	28,762	26,811	183.2	174.1	53	58.6
Saskatchewan	82	77	16,252	14,578	198.2	189.3	77	50.9
Alberta	351	326	56,909	53,065	162.1	162.8	74	64.8
British Columbia	270	251	51,135	49,238	189.4	196.2	67	53.6
CANADA	7,522	6,950	674,450	645,627	89.7	92.9	26	69.5

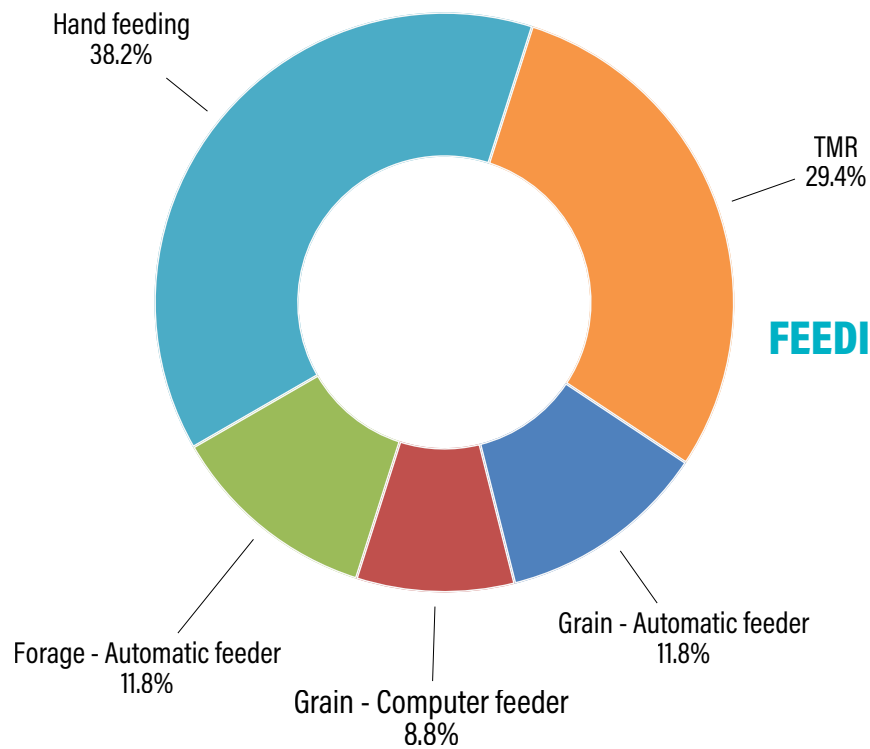


MANAGEMENT SYSTEM TYPE IN THE ATLANTIC PROVINCES

BARN TYPE

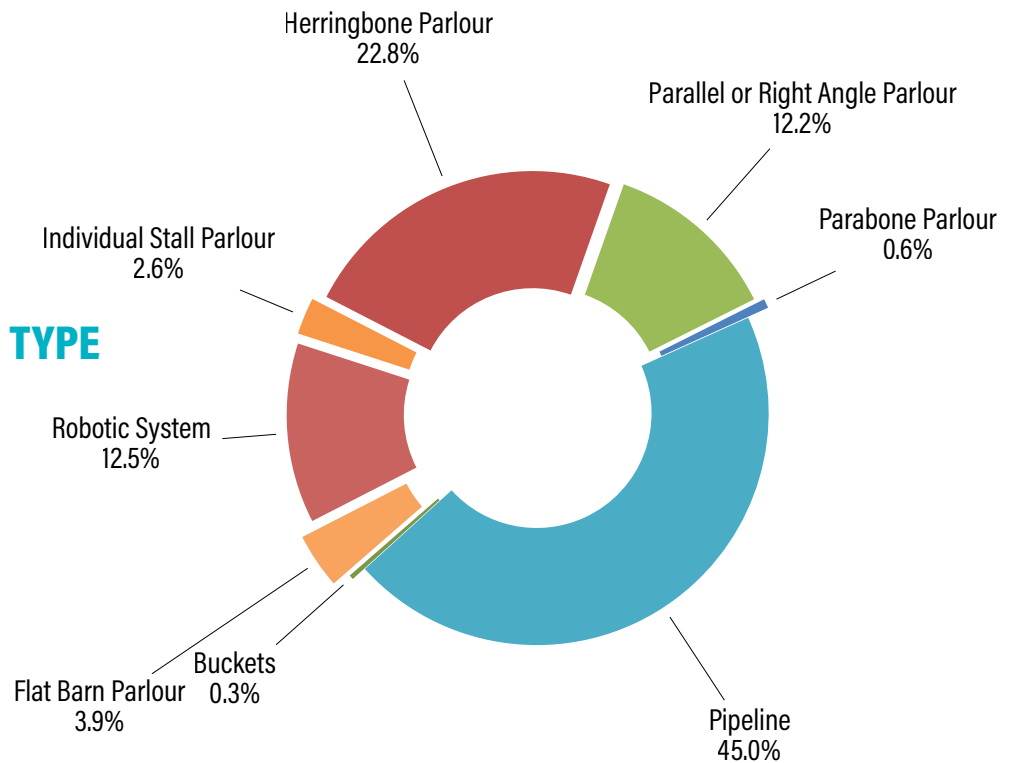


FEEDING SYSTEMS

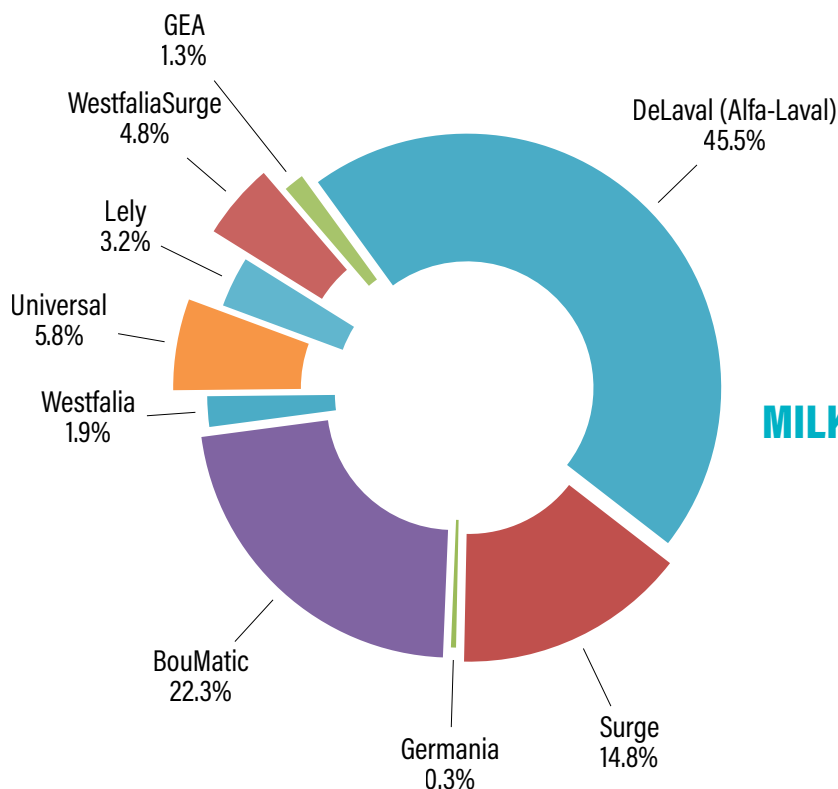


MANAGEMENT SYSTEM TYPE IN THE ATLANTIC PROVINCES

MILKING SYSTEM TYPE



MILKING SYSTEM BRAND



LACTANET-ATLANTIC PRODUCTION AND MANAGEMENT AVERAGES - DECEMBER 2019

Breed	Average	Percentile 10	Percentile 90	Average	Percentile 10	Percentile 90	
Milk Production (kg)				Fat, kg (%)			
Holstein	9,861	7,700	11,921	400 (4.06)	309 (3.83)	497 (4.31)	
Ayrshire	7,150	5,618	8,437	303 (4.24)	242 (4.06)	365 (4.38)	
Jersey	6,699	5,804	7,561	334 (4.99)	276 (4.82)	377 (5.22)	
All Breeds	6,699	5,804	7,561	394 (4.10)	306 (3.83)	494 (4.36)	
Age at First Calving (yy-mm)				Protein, kg (%)			
Holstein	2-2	2-6	1-11	327 (3.31)	254 (3.18)	254 (3.18)	
Ayrshire	2-4	2-7	2-1	240 (3.36)	182 (3.24)	182 (3.24)	
Jersey	2-1	2-4	1-11	254 (3.80)	218 (3.73)	218 (3.73)	
All Breeds	2-2	2-6	1-11	320 (3.33)	245 (3.19)	245 (3.19)	
Weight at First Calving (kg)				Average Herd Weight Including Cow-Heifers (kg)			
Holstein	622	579	671	674	626	700	
Ayrshire	**	**	**	**	**	**	
Jersey	**	**	**	**	**	**	
All Breeds	622	579	671	674	626	700	
Longevity (% 3 rd Lactation plus)				Margin Over Feed Cost (\$/cow/year) *			
Holstein	38.5	28.6	49.2	4,913	3,918	5,968	
Ayrshire	50.4	42.7	58.6	**	**	**	
Jersey	44.6	31.7	54.1	**	**	**	
All Breeds	39.1	28.7	50.2	4,736	3,503	5,856	
				Other Parameters (All Breeds)			
SCC ('000 s.c./ml)				Average		Percentile 10	Percentile 90
Holstein	194	304	106	Cows in Milk (%)	86	80	90
Ayrshire	183	303	113	Replacement Rate (%)	40.1	23.7	52.4
Jersey	198	271	87	Dry Period (days)	73	102	53
All Breeds	194	300	106	Calving Interval (days)	420	461	386
				Linear Score	2.4	3.0	1.8

* Milk value minus feed cost.

** A minimum of 5 herds is required to calculate an average; this minimum is not met.

CONTACT INFORMATION

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WASTING NUTRIENTS IS LIKE THROWING MONEY OUT THE WINDOW!

"Milk urea nitrogen testing is an excellent tool. As a nutritionist, it helps me to prevent overfeeding of protein, which saves money on the farm. Also, it helps me fine tune rations in case I am underfeeding fresh cows. I recommend it on a regular basis, as the value provided far outweighs the cost."

- DANIEL SCOTHORN, SCOTHORN NUTRITION*

I choose to put
"Mun-ey"
in my pocket!



MUN BENEFITS

- Results by stage of lactation
- Cow by cow results for an individual follow-up
- Identification of the out-of-range cases
- Comparison with the breed average performance
- Test done with your milk recording sample
- Results available 48 hours after the test



NEGATIVE EFFECTS OF HIGH MUN

- Wasted money due to unnecessary feed costs
- Low production and low protein
- Loss of profit due to reproduction problems:
 - Embryotic death
 - Irregular intervals between breeding
 - Impact on heifer replacement



NEGATIVE EFFECTS OF LOW MUN

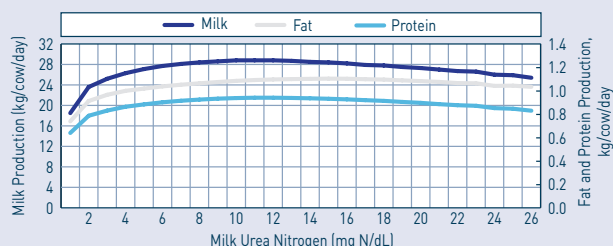
- Lower production
 - Increased feed cost due to higher protein requirements
 - Poor rumen health (acidosis and limited microbial population)

MUN ANALYSIS

MUN analysis is a great indicator of the efficiency of protein use from a ration. The higher the concentration of urea, the larger the proportion of wasted feed protein, and the more excretion of nitrogen there is in the urine.

MUN values below 8 will result in lower production, probably due to a lack of protein availability in the rumen. Values higher than 14, however, will not translate into higher production.

MILK, FAT AND PROTEIN PRODUCTION VERSUS MUN



High values reveal a less than optimal use of feed protein, and consequently, significant nitrogen waste.